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"I like the sound of that!" Wine descriptions influence consumers' expectations, liking, emotions and willingness to pay for Australian white wines

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ABSTRACT

This study investigated how information, typically presented on wine back-labels or wine company websites, influences consumers' expected liking, informed liking, wine-evoked emotions and willingness to pay for Australian white wines. Regular white wine consumers (n = 126) evaluated the same set of three commercially available white wines (mono-varietal Chardonnay, Riesling, Sauvignon Blanc) under three information levels. Session 1, blind tasting (no information provided) and Session 2, informed tasting (held at least 1 week later) with both basic (sensory description of the wines) and elaborate (sensory plus high wine quality and favourable winery information) descriptions followed by liking, wine-evoked emotions (measured with the Australian Wine Evoked Emotions Lexicon (AWEEL)) and willingness to pay evaluations. Before tasting the wine in session 2, consumers also rated expected liking.

Results showed that information level had a significant effect on all investigated variables. The elaborate information level evoked higher expectations before tasting the wines, plus resulted in higher liking ratings, elicitation of more intense positive (e.g. *contented*, *happy and warm-hearted*) and less intense negative emotions (e.g. *embarrassed and unfulfilled*), and a substantial increase in willingness to pay after tasting the wines compared to the blind condition, with the basic condition ranging in-between. These results were consistent across the three wine samples.

Furthermore, if the liking rating after tasting the wines matched the expected liking or exceeded the expectations by 1 point on a 9-point hedonic scale, participants felt the most intense positive emotions and the least intense negative emotions. Whereas, if the expectations were not met or the actual liking exceeded the expectations by > 2 points, participants felt less intense positive and more intense negative emotions. This highlights not only the importance of well written and accurate wine descriptions, but also that information can influence consumers' wine drinking experience and behaviour.

1. Introduction

For consumers, choosing the "right" wine at the point of sale is a difficult task whether it be in a brick-and-mortar retail outlet or online. Australia alone has 2468 wine producers (http://winetitles.com.au/statistics) and each produces a wide range of wines of different grape varieties and styles. Wine descriptions and information presented on, back labels of wine bottles, wine menus or online shops can provide consumers with useful information and potentially influence their wine choice. The importance of wine labels and label information has been widely studied (Barber, Ismail, & Taylor, 2007; Chaney, 2000; Sherman & Tuten, 2011; Tang, Tchetchik, & Cohen, 2015; Thomas & Pickering, 2005) and for back labels in particular (Barber, Almanza, & Donovan, 2006; Kelly & Hyde, 2015; Mueller, Lockshin, Saltman, & Blanford, 2010) showing that they can play an important role for consumer choice. Mueller, Lockshin, et al. (2010) and Mueller, Osidacz, Francis and Lockshin (2010) concluded that aside from price and ingredient list, winery history and elaborate taste descriptions were found to be the most valued back label statements for wine consumers when choosing a wine.

However, only a very limited number of studies have investigated the interplay of information presented on wine labels and intrinsic product characteristics in combination with preference tasting (Charters, Lockshin, & Unwin, 1999; Mueller, Osidacz, et al., 2010).

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Gmuer, Siegrist, and Dohle (2015) showed that wine label processing fluency (readability of the label) but not the suggested consumption domain (everyday vs special-occasion), influenced the hedonic rating of the wine. D'Alessandro and Pecotich (2013) found that experts and novices are both influenced by extrinsic cues when choosing, judging quality and pricing wine. Whereas in their study country of origin information had a significant effect on experts and novices, experts additionally use physical (sensory) quality as a guide for quality and price evaluations. Novices on the other hand relied more on brand name.

The ability to predict actual consumer food choice behaviour using consumer acceptability measurements is limited, as it does not provide deep insights into consumers' feelings and motivations. Research on food-evoked emotions has shown that; emotional benefits could potentially differentiate products of similar liking (Danner, Haindl, Joechl, & Duerrschmid, 2014; Jiang, Niimi, Ristic, & Bastian, 2017; King & Meiselman, 2010; Mojet et al., 2015; Porcherot et al., 2012), product-evoked emotions can be a better predictor for food choice than liking alone (Dalenberg et al., 2014) and a combination of product-evoked emotions and liking resulted in the most accurate food choice prediction (Gutjar et al., 2015). This confirms previous studies showing that measuring emotions provides additional information over and above liking alone (Ng, Chaya, & Hort, 2013a; Spinelli, Masi, Dinnella, Zoboli, & Monteleone, 2014).

As part of the product appraisal framework, Lundahl (2011) identified consumer concerns and expectations, together with sensory attributes during product appraisal as important contributors to the formation of product-evoked emotions. Information and packaging cues can significantly influence expectations and therefore also affect emotional responses (Ng, Chaya, & Hort, 2013b; Spinelli, Masi, Zoboli, Prescott, & Monteleone, 2015). The influence of extrinsic cues such as labelling (Dransfield, Zamora, & Bayle, 1998; Gallina Toschi et al., 2012; Norton, Fryer, & Parkinson, 2013), price (Guinard, Uotani, & Schlich, 2001), brand and/or the package itself (Mizutani et al., 2010), verbal or written information (Cardello & Sawyer, 1992; Tuorila, Meiselman, Bell, Cardello, & Johnson, 1994) on sensory expectations and sensory perception of products has been widely studied (for an extensive review see Piqueras-Fiszman and Spence (2015)).

From a researcher point of view, cases of mismatch between expectations and sensory perception are of special interest since this disconfirmation can lead to changes in product acceptability (Cardello, 2007; Fernqvist & Ekelund, 2014). According to the assimilation/contrast model (Anderson, 1973; Hovland, Harvey, & Sherif, 1957) a mismatch between expectations and sensory perception can either result in assimilation (informed ratings move towards expectations, the assimilation is complete when the informed ratings match the expectations) or contrast (informed ratings shift away from expectations) effects. Assimilation tends to occur when the mismatch is small and contrast when mismatch is large (Piqueras-Fiszman & Spence, 2015; Schifferstein, Kole, & Mojet, 1999).

More recently, studies have investigated the influence of extrinsic attributes including; packaging/branding (Chaya, Pacoud, Ng, Fenton, & Hort, 2015; Ng et al., 2013b; Schifferstein, Fenko, Desmet, Labbe, & Martin, 2013; Spinelli et al., 2015), health labels (Lagerkvist, Okello, Muoki, Heck, & Prain, 2016; Schouteten et al., 2015), or congruent vs incongruent information (Silva et al., 2017) on product-evoked emotions and its relationships with product intrinsic sensory characters. Chaya et al. (2015) measured the emotional responses of regular lager beer consumers to a broad range of commercial lager beers under three conditions; blind tasting, packaging only and informed tasting (tasting together with packaging) and found that although sensory attributes and packaging influenced emotional responses, packaging cues were more influential compared to sensory attributes alone. Using a similar study design investigating hazelnut and cocoa spreads, Spinelli et al. (2015) found that if expectations based on the packaging/branding of the product either matched or mismatched with liking, the emotional performance of the product differed, and was more dependent upon the informed tasting compared to a blind tasting. Both studies highlighted the importance of collecting emotional responses in blind and informed conditions to gain better insights on consumers' product perception for informed product optimisation.

Although buying, cellaring and/or drinking wine can clearly be an emotional experience, scientific studies investigating consumers' emotional responses to wine are scarce (Niimi, Danner, Li, Bossan, & Bastian, 2017; Jiang et al., 2017; Danner et al., 2016; Ferrarini et al., 2010). Also, studies exploring the influence of information, branding, or packaging of wine on consumers' expectations and how meeting these expectations influence wine-evoked emotions, liking and willingness to pay are still lacking.

1.1. Study aims

The primary aim of this study was to explore whether different information levels: blind tasting; basic sensory information; and elaborate sensory plus high wine quality and favourable winery information; influence consumers' emotional response profiles, liking and willingness to pay for commercial white wines. We hypothesised that more elaborate information provided to consumers would positively impact their emotional, hedonic and willingness to pay responses and quality rating of the wine.

The second objective was to investigate how expectations and either their confirmation or disconfirmation after tasting, influence consumers' wine-evoked emotions, willingness to pay and quality ratings of the wines.

2. Materials and methods

This study consisted of three distinct phases: i) wine sample selection; ii) development of wine descriptions; and iii) a consumer test in which regular white wine consumers tasted the selected wine samples under three conditions; blind, basic (basic sensory description) and elaborate information (elaborate wine sensory, quality and producer description) level.

2.1. Sample selection and characterisation

The aim was to select three clearly different white wines for the consumer testing. From a larger group of 21 white wines which underwent descriptive analysis (Lawless & Heymann, 2010), one Chardonnay, Riesling and Sauvignon Blanc wine was chosen by four wine experts (Parr, Heatherbell, & White, 2002). These varieties were chosen because they are the most commonly consumed white wine varieties in Australia and have very distinct sensory characteristics.

The DA was used to objectively describe the sensory properties of wines and consisted of 8 two-hour training sessions and 4 formal evaluation sessions. The screened (using ISO standards) tasting panel comprised of 6 females and 5 males (average age 40), who had previously participated in several descriptive analyses on wine. During the training, assessors developed the vocabulary and practiced sensory attribute recognition and scale usage, using reference standards. Following sessions focused on panellist sample discriminability, repeatability and consensus among assessors using some of the treatment samples following the procedure outlined by Lawless and Heymann (2010).

The wines were formally evaluated in duplicate over the course of 4 sessions (10 or 11 samples per session) at 20 °C under white lights. The sensory evaluation took place in individual booths at the sensory laboratory of The University of Adelaide, Australia. The wines were presented to panellists as 30 mL samples in 4-digit coded, covered, black ISO standard wine glasses. Panellists evaluated the agreed 12 aroma, 16 flavour and 2 mouthfeel attributes (see Supplementary Table A1) while holding the wine in the mouth and after expectoration. The

intensity of sensory attributes was rated on a 15 cm visual analogue scale, with anchor points of 'not present' (at 0% of the line) and 'very intense' (at 100% of the line). Panellists were instructed to neutralise their palate between samples with unsalted crackers and water. A minimum 60 s break between samples and 5 min after 6 samples was enforced. After evaluating the aroma and flavour attributes, the wines were presented in clear ISO standard wine glasses to evaluate colour and appearance attributes. Data was acquired with RedJade software (RedJade, Redwood City, USA) and analysed by a two-way ANOVA with panellists as random and samples as fixed factor using SPSS 24 (2013, IBM Corporation, Armonk, USA).

2.2. Development of basic and elaborate wine descriptions for the informed tasting conditions

Mueller, Lockshin, et al. (2010) and Mueller, Osidacz, et al., (2010) showed that aside from price and ingredient list, winery history and taste descriptions were the most valued statements on back labels that wine consumers utilised when choosing a wine. Wine descriptions are now also common place on winery websites. Based on this, two different descriptions were developed by two wine experts experienced in writing wine back labels and wine descriptions. A basic description, solely based on the sensory properties of the wine profile defined by the DA and a more elaborate description, incorporating additional background/history information of the winery, wine quality and more emotive sensory terms.

The aim of the basic descriptions was to objectively and clearly communicate the sensory properties of the wines based on the results of the DA (Fig. 1). The aim of the elaborate descriptions was to describe the wines in a more detailed and emotive way, similar to descriptions often found on wine back labels, on winery websites or in online shops. To achieve this, more vivid examples were included to describe the sensory characteristics of the wine, as well as incorporation of aspects highlighting the high quality of associated wines and favourable background information (history, tradition) of the winery. These were initially generated by remodelling the producers' actual descriptions of their wines and wineries on the bottles and homepages and merging this with the DA sensory descriptors.

Prior to the main consumer test, feedback from a focus panel of 12 regular white wine consumers who tasted the wines and read the descriptions was incorporated to ensure that the descriptions were easy to understand by regular consumers and also congruent with the sensory characteristics of the wines from a consumer's perspective. The final descriptions of the wines used for the study are provided in Table 1.

2.3. Consumer sample

Wine consumers were recruited using the wine consumer database of the Department of Wine and Food Science at the University of Adelaide and were screened against inclusion criteria, requiring them to be of legal drinking age (i.e. ≥ 18 years of age), permanent Australian residents or citizens and having consumed white wine at least once a month in the past year and have not participated in any wine tasting or consumer research at the University of Adelaide in the past 6 months. A total of 126 consumers successfully completed the online recruitment and demographic questionnaire administered via SurveyMonkey™, fulfilled the inclusion criteria and completed both tasting sessions (see Table 2 for basic demographic information of the consumer sample, and Table 3 for consumption frequency by wine variety).

Participants gave written informed consent prior to the first tasting session and received an AUD 40 gift voucher to a well-known chain store upon completion of both tastings. The study was performed in accordance with the ethical guidelines for scientific research at the University of Adelaide and was approved by the human ethics

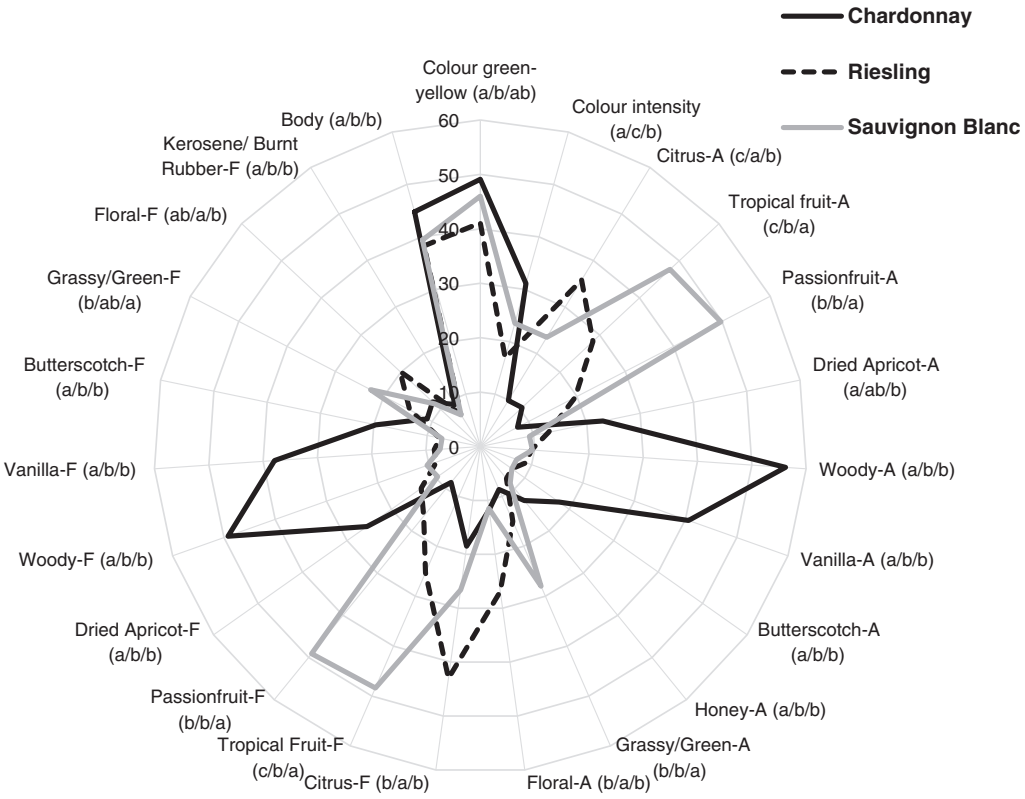

Fig. 1. Sensory profiles of the 3 white wines determined by descriptive analysis (n = 11). Only sensory attributes discriminating between wines at $p < 0.05$ are presented. The results of the post-hoc comparisons (Fisher LSD) are presented as letters (left to right = order of legend; means with different letters are significantly different at $p < 0.05$). "A" stands for aroma and "F" for flavour attributes.

Table 1
Basic and elaborate wine descriptions presented together with the wines in the informed condition.

	Basic description	Elaborate description
Chardonnay	This mouth filling, golden coloured Chardonnay displays aromas and flavours of honey, dried apricots, vanilla, butterscotch and oak, all prominent in the long finish.	Our company recently celebrated 170 years of winemaking excellence. This unique Chardonnay has evolved into a benchmark, single-region style. It shows an abundant complex array of aromas and flavours including sweet vanilla, butterscotch, honey, freshly-picked stone fruit and toasty oak. The satisfying velvety creaminess of this wine lingers in the mouth.
Riesling	This Riesling has a pale yellow/green colour. The nose shows upfront, citrus fruit aromas supported by floral notes that follow through on the palate, and leaves the mouth with a crisp acidic finish.	Our family has been making exceptional wines for 145 years. This stunning Riesling is a respectful nod to our forebears and was lovingly crafted using handpicked fruit from our highest altitude vineyards. It displays refreshing lemon and lime fruits accompanied by delicate jasmine flower aromas. These characters flow on to a lively palate which has a pleasant, racy acid finish.
Sauvignon Blanc	This pale lemon coloured Sauvignon Blanc has intense tropical fruit and passionfruit aromas and flavours, accompanied by grassy green characters ending with a light acid finish.	This handcrafted Sauvignon Blanc was carefully blended from our very best parcels of fruit, sourced from pristine vineyards with ancient soils. Our winery sits atop a strikingly beautiful hill overlooking these majestic vines. This wine displays intoxicating passionfruit and other tropical fruits balanced by soft herbal and fresh cut grass, ending with an invigorating and crisp finish.

Table 2
Demographic characteristics of the participants completing both tasting sessions (n = 126).

	% of total (n = 126)
Gender	
Male	46.0
Female	54.0
Age	
18–34	20.6
35–49	22.2
50–64	35.7
65 +	21.4
Education	
No tertiary	43.6
Bachelor degree	24.6
Postgraduate degree	31.8
Household income (AUD)	
< $50,000	18.3
$50,001–$100,000	42.0
$100,001–$200,000	30.2
> $200,000	9.5
General wine consumption frequency	
Few times per week	73.0
Once a week	13.5
Once every 2 weeks	10.3
Once a month	3.2

Table 3
Wine consumption frequency by variety (n = 126).

Wine consumption frequency	% of total (n = 126)		
	Chardonnay	Riesling	Sauvignon blanc
Frequently (more than once a week)	8.7	7.1	11.1
Regularly (more than once a month)	20.6	36.4	40.5
Occasionally (6 times a year to once a month)	29.4	33.3	31.7
Rarely (2 to 5 times a year)	23.0	14.3	8.7
Once a year	10.3	5.7	3.2
Never	7.9	3.2	4.8

committee (approval number: H-2013-048).

2.4. Liking and psychographic scales

After tasting a sample, consumers first stated their hedonic liking (9-point hedonic scale), followed by wine-evoked emotions using the Australian Wine Evoked Emotions Lexicon (AWEEL) (Danner et al., 2016), familiarity (How familiar are you with the flavour of this wine? 1 - not familiar at all to 9 – very familiar), willingness to pay for a bottle of wine in a shop (How much will you be willing to spend for a bottle of this wine in a retail bottle shop? Value in AUD.) and rate the quality of the tasted wine (In your opinion what is the quality of this wine? 4-point scale; low, low-medium, medium-high and high). The AWEEL from Danner et al. (2016), consists of 19 emotion terms including; 11 emotions with positive valence (*adventurous*, *calm*, *contented*, *enthusiastic*, *happy*, *nostalgic*, *optimistic*, *passionate*, *relaxed*, *surprised*, and *warm hearted*) and 8 with negative valence (*embarrassed*, *envious*, *irritated*, *lonely*, *panicky*, *sad*, *tense*, and *unfulfilled*) which were rated on a 9-point scale from 1 – not at all to 9 - extremely. The emotion list of the AWEEL was presented in alphabetical order to make the task easier and faster for the consumers (Dorado, Chaya, Tarrega, & Hort, 2016; King & Meiselman, 2010).

2.5. Experimental design

To investigate the effect of the three information levels (blind, basic and elaborate) the consumer evaluation was split into two tasting sessions which were at least one week apart (Fig. 2 provides a graphical overview of the experimental design). The participants were not informed that the two tastings were related, instead they were told that they were participating in two independent studies requiring the same demographic distribution and therefore recruitment was combined and consumers were encouraged to participate in both sessions/studies. The consumer tastings took place in the sensory laboratory of the University of Adelaide. To control for first position effects, as suggested by Dorado, Pérez-Hugalde, Picard and Chaya (2016), a commercial unoaked Chardonnay was presented as a warm-up sample in both tasting sessions. Additionally, this sample was also used to test if consumers' hedonic evaluation changed between the first to the second tasting session.

2.5.1. Tasting session 1: blind tasting without information

After check-in and signing the consent forms, participants received a warm-up sample followed by the 3 white wine samples. The samples were presented blind (without any information), coded and sequentially monadic in randomized order. Consumers were required to complete the liking and psychographic scales as described in the previous Section 2.4, administered by RedJade (RedJade, Redwood City, USA), together with each sample.

2.5.2. Tasting session 2: informed tasting

Tasting Session 2 started with the evaluation of the same warm-up sample as used in session 1, followed by the 3 white wine samples. Each of the 3 white wine samples was presented twice, once together with

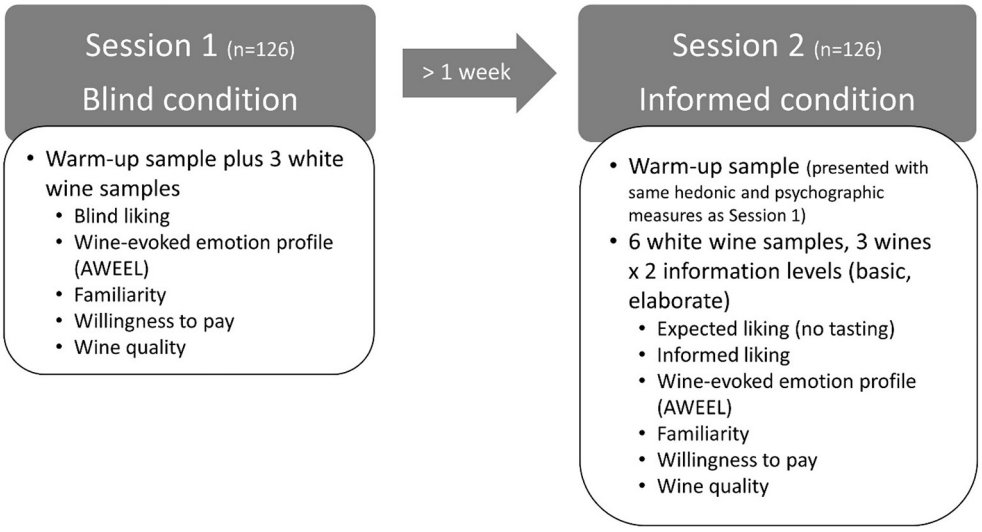

Fig. 2. Graphical overview of the sensory testing.

the basic wine descriptions and once with the elaborate descriptions in randomized order, making a total of 7 samples for each consumer. Before receiving the wine sample, participants received the corresponding wine description on paper and were instructed to carefully read the description followed by rating how much they expected to like a wine with this description on a 9-point hedonic scale. After rating the expected liking, they received the relevant wine sample and evaluated the wine using the same liking and psychographic scales as in session 1. The samples were presented sequentially monadic, coded and in randomized order. Participants were not made aware that they received the same samples twice or of the nature of the warm-up sample and were only told that they were going to receive 7 white wines samples in this study.

Up to 12 wine consumers attended the 30–45 min tasting sessions, held between 4 pm and 7 pm in the sensory laboratory. Participants were seated in individual tasting booths and water and crackers were provided for palate cleansing. All samples (30 mL) were presented at 12–13 °C in clear ISO glasses coded with 4-digit codes, under white lights. Participants were instructed to taste the wines as they would normally consume wine and drink at least 2 sips before answering the questions.

2.6. Data analyses

The warm-up sample was presented with the questionnaire of session 1 in both sessions making it possible to test if consumers' hedonic evaluation of the warm-up sample changed from the first to the second tasting session. Repeated Measures Analysis of Variance (RANOVA) was performed with liking as dependent variable and tasting session as within subject factor. To investigate the effects of tasting session on the emotion ratings, Repeated Measures Multivariate Analysis of Variance (RMANOVA) was performed in a similar way with emotion ratings as dependent variable and tasting session as within-subject factor. Results of the RANOVA ($F(1, 125) = 1.367$, $p = 0.245$) for liking and the RMANOVA ($F(19, 107) = 1.269$, $p = 0.220$) for the emotions showed that tasting session did not have a significant influence on consumers' liking or wine-evoked emotion ratings of the warm-up sample, indicating that the warm-up sample was evaluated in a similar way in both tasting sessions and no significant learning or familiarisation effects occurred between the first and second tasting.

A similar RANOVA/RMANOVA approach was chosen to analyse sample and information effects on liking, wine-evoked emotions, familiarity, willingness to pay and wine quality by including liking, wine-evoked emotions, familiarity, willingness to pay or wine quality as dependent variables and sample and information level as fixed within-subject factors. In case of violation of the assumption of sphericity for any of the variables of the RANOVA/RMANOVAs, Greenhouse–Geisser correction was applied.

To investigate hedonic disconfirmation effects on emotions, familiarity, willingness to pay and wine quality, disconfirmation was calculated by subtracting expected liking from the actual liking rating for each sample across all participants and both informed conditions. In a next step, MANOVA with the 19 emotion terms as dependent variables and disconfirmation as fixed factor was conducted. Effects on familiarity, willingness to pay and wine quality were investigated using one-way ANOVAs.

All statistical analyses were performed with SPSS 24 (2013, IBM Corporation, Armonk, USA) at 5% level of significance and for post-hoc comparison, Fisher's LSD was used.

3. Results and discussion

3.1. Wine variety and information effects on liking ratings

Table 4 shows the results of the Repeated Measures ANOVAs investigating the main and interaction effects of sample and information on consumers' liking rating and product-evoked emotions. Significant sample ($F(1.602, 200.225) = 23.352$, $p < 0.001$) and information effects ($F(1.760, 220.019) = 40.145$, $p < 0.001$) were found, but no significant sample by information level interactions ($F(6.025, 454.756) = 0.721$, $p = 0.565$). These findings are in agreement with several other studies showing that presenting product description or labelling information can significantly influence liking ratings (e.g. Cardello & Sawyer, 1992; Mueller & Szolnoki, 2010; Ng et al., 2013b; Schouteten, De Steur, Lagast, De Pelsmaeker, & Gellynck, 2017; Schouteten, De Steur, Sas, De Bourdeaudhuij, & Gellynck, 2016; Tuorila et al., 1994 for a review on this topic see Piqueras-Fiszman & Spence, 2015).

Fig. 3 shows the mean liking ratings and the results of the post-hoc comparisons for the different samples and information levels, revealing a consumer preference for the Sauvignon Blanc and Riesling over the Chardonnay, irrespective of the information level. No significant differences in liking were observed between the Sauvignon Blanc and Riesling samples. The elaborate information resulted in significantly higher expected liking ratings compared to the basic wine description solely based on sensory properties of the wines, however no significant differences within each information level were found across the wine samples, indicating that consumers expected to like all three wines

Table 4
Results of the mixed model ANOVA investigating effects of sample and information level on liking and product-evoked emotions.

	Sample					Information level					Sample × information level				
	df	Error df	F	p	Partial η^2	df	Error df	F	p	Partial η^2	df	Error df	F	P	Partial η^2
Liking	1.60	200.23	23.35	< **0.001**	0.157	1.76	220.02	40.15	< **0.001**	0.243	3.64	454.76	0.72	0.565	0.006
Adventurous	1.78	222.20	12.86	< **0.001**	0.093	1.47	183.31	10.02	< **0.001**	0.074	4	500	0.29	0.887	0.002
Calm	1.71	214.06	9.23	< **0.001**	0.069	1.61	201.34	7.87	**0.001**	0.059	3.68	460.74	0.51	0.716	0.004
Contented	1.57	196.26	10.14	< **0.001**	0.075	1.67	208.68	5.93	**0.005**	0.045	4	500	0.92	0.452	0.007
Embarrassed	1.70	212.84	7.59	< **0.001**	0.057	1.83	229.21	3.09	0.052	0.024	3.09	386.66	0.40	0.761	0.003
Enthusiastic	1.69	211.44	12.97	< **0.001**	0.094	1.71	213.74	9.73	< **0.001**	0.072	4	500	1.91	0.108	0.015
Envious	1.72	215.17	0.27	0.730	0.002	1.83	228.64	0.10	0.890	0.001	3.38	422.01	1.82	0.136	0.014
Happy	1.66	206.99	16.21	< **0.001**	0.115	1.67	208.73	12.32	< **0.001**	0.090	4	500	0.72	0.576	0.006
Irritated	1.60	199.41	16.43	< **0.001**	0.116	1.83	228.97	6.43	**0.003**	0.049	3.56	444.44	1.04	0.382	0.008
Lonely	1.81	225.75	1.81	0.169	0.014	1.51	188.28	0.66	0.477	0.005	3.21	401.55	3.31	**0.018**	0.026
Nostalgic	1.87	233.29	0.20	0.806	0.002	1.85	230.66	9.52	< **0.001**	0.071	3.67	462.25	0.72	0.572	0.006
Optimistic	1.68	210.08	6.91	**0.002**	0.052	1.73	216.07	11.54	< **0.001**	0.085	4	500	0.66	0.618	0.005
Panicky	1.42	177.27	7.59	**0.002**	0.057	2	250	0.32	0.726	0.003	3.23	404.16	0.57	0.648	0.005
Passionate	1.67	208.13	7.94	**0.001**	0.060	1.82	227.18	14.44	< **0.001**	0.104	3.73	466.24	0.47	0.742	0.004
Relaxed	1.68	210.07	9.79	< **0.001**	0.073	1.75	219.16	7.68	**0.001**	0.058	4	500	0.58	0.679	0.005
Sad	1.32	165.33	17.11	< **0.001**	0.120	1.79	223.14	0.55	0.558	0.004	3.13	390.74	0.76	0.521	0.006
Surprised	2	250	2.70	0.069	0.021	2	250	4.18	**0.016**	0.032	3.68	460.19	2.05	0.092	0.016
Tense	1.59	198.96	11.77	< **0.001**	0.086	2	250	6.85	**0.001**	0.052	3.50	437.89	0.97	0.417	0.008
Unfulfilled	1.56	195.00	17.93	< **0.001**	0.125	1.83	228.12	10.13	< **0.001**	0.075	3.74	467.47	0.54	0.696	0.004
Warm-hearted	1.63	203.79	7.84	**0.001**	0.059	1.70	212.53	10.12	< **0.001**	0.075	4	500	0.16	0.961	0.001

Bolded values indicate significant effects at $p < 0.05$.

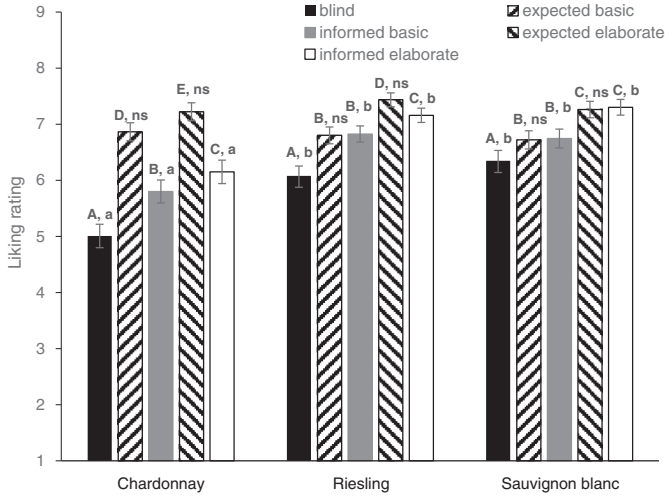

Fig. 3. Mean expected liking and informed liking ratings for the three wines in the information levels; blind tasting, basic and elaborate information level (n = 126; 1 = dislike extremely to 9 = like extremely). Capital letters indicate significant differences in liking ratings within one wine variety based on post-hoc comparisons using Fisher's LSD $p < 0.05$. Lower case letters indicate significant differences in liking ratings across wine variety based on post-hoc comparisons using Fisher's LSD $p < 0.05$. Error bars indicate standard error.

similarly based on their descriptions. Significant assimilation effects (liking moves towards expectations) (Anderson, 1973; Hovland et al., 1957; Piqueras-Fiszman & Spence, 2015; Schifferstein et al., 1999) were found for all three wine varieties, confirming previous findings by Lange, Martin, Chabanet, Combris, and Issanchou (2002) on Champagne. The elaborate informed condition resulted in an increase in actual liking of approximately 1 point on a 9-point-hedonic scale over the blind evaluation, whereas the basic information level ranged in between for all three samples. Complete assimilation was observed for Sauvignon Blanc (i.e. expected liking equals informed liking), while complete assimilation was seen for the Riesling in the basic condition only. Partial assimilation was observed under both information levels for Chardonnay, and for Riesling under the elaborate condition. A possible explanation for the incomplete assimilation for Chardonnay could be the relatively large differences between expected and blind liking. These results show that information can not only influence consumers' wine choice (Barber et al., 2007; Chaney, 2000; Sherman & Tuten, 2011; Tang et al., 2015; Thomas & Pickering, 2005) but also changes the overall consumption experience.

3.2. White wine variety and information effects on product-evoked emotions

The results of the RMANOVA showed that white wine variety ($F(38, 88) = 2.625$, $p < 0.001$) and information ($F(38, 88) = 2.065$, $p = 0.003$) had a significant effect on the wine-evoked emotions. The consecutive univariate tests revealed that out of the investigated 19 emotion terms, 15 terms significantly discriminated between wine styles and 14 between information levels (see Table 4, and Supplementary Table A2 for detailed information on post-hoc comparisons and standard errors). Whereas *embarrassed*, *panicky* and *sad* were only influenced by wine style and not by information level, the opposite was true for *nostalgic* and *surprised*, being only influenced by information level. Furthermore, significant interactions between wine style and information level were found by the RMANOVA ($F(76, 50) = 1.758$, $p = 0.017$), however the univariate analyses identified lonely as the only emotion with significant interactions. Consecutive pairwise comparisons (data not shown) indicated that lonely decreased when more detailed information was provided for the Sauvignon Blanc and Riesling whereas the opposite effect was found for Chardonnay. However, these effects were very small and the mean values only ranged between 1.15 and 1.40 (see Supplementary Table A2). The absence of significant interactions for most emotions indicated that different information had a similar effect on wine-evoked emotions irrespective of the wine variety.

Investigating the effects of wine style in more detail, the results showed that the tasted wines evoked weak to moderately intense emotions of positive valence, with mean intensities ranging between 3 – weak and 5 – moderate (Fig. 4). Comparing the three wine varieties, the Sauvignon Blanc wine evoked significantly more intense positive emotions of *calm*, *contented*, *enthusiastic*, *happy*, *optimistic*, *passionate*, *relaxed*, *sad*, and *warm-hearted* compared to the Chardonnay sample, with the Riesling mostly ranging in between those samples, irrespective of the information level. *Surprised* discriminated only in the blind condition, showing that participants were most surprised by the Chardonnay and the least by the Riesling sample. Emotions of negative valence were generally evoked to only a very low extent with

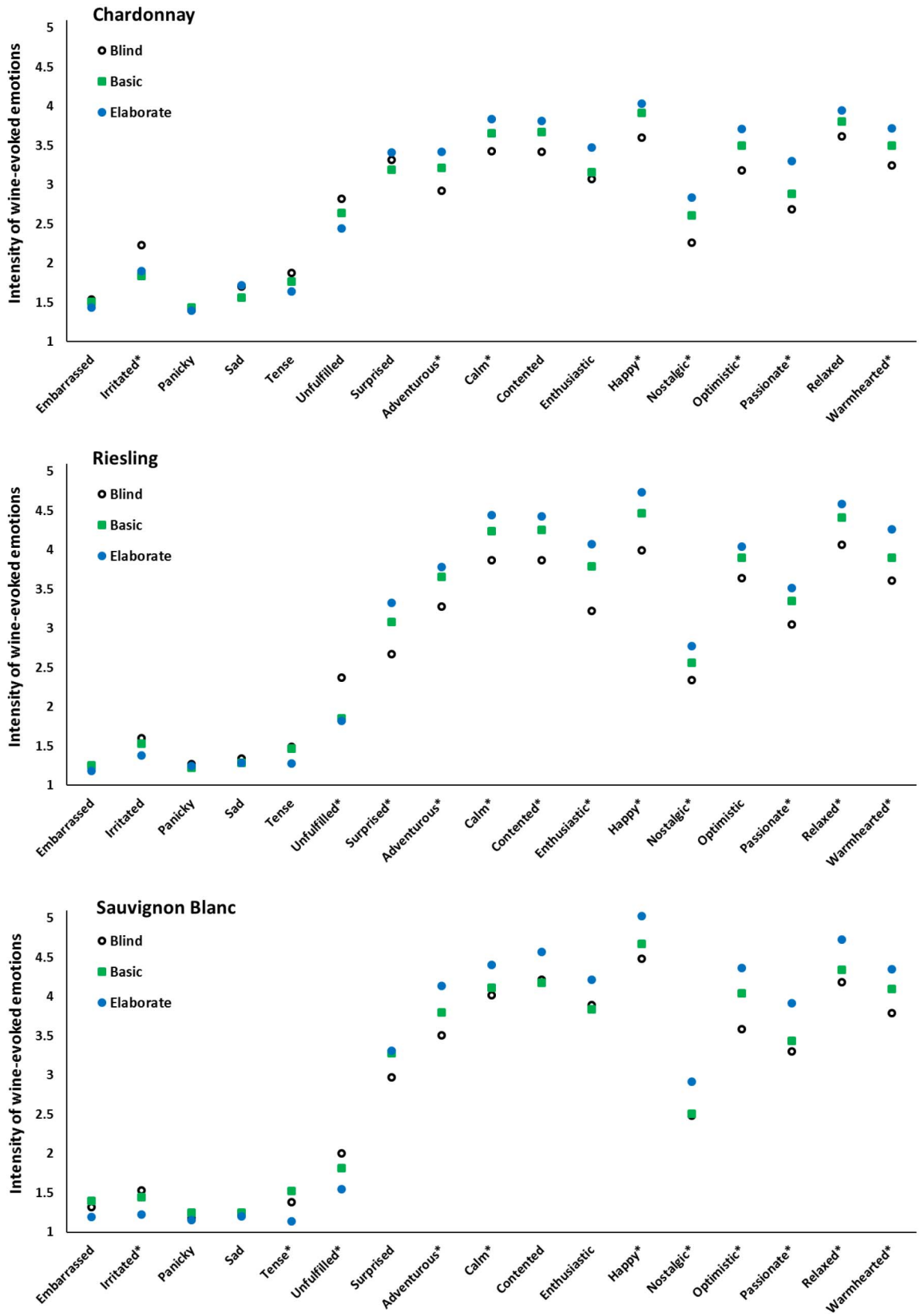

Fig. 4. Wine-evoked emotion profiles for a) Chardonnay, b) Riesling and c) Sauvignon Blanc for the three different information levels blind, basic and elaborate description. Intensities of the perceived emotions were measured on a 9-point scale, ranging from 1 = not at all to 9 = extremely. Only emotion terms which discriminate between wine style and/or information ($p < 0.05$) condition are presented. *indicates significant differences between information level within one wine variety ($p < 0.05$).

Chardonnay evoking slightly more intense emotions of *embarrassed*, *irritated*, *panicky*, *sad* and *unfulfilled* compared to the other two samples in all three information levels. Whereas, *embarrassed* and *tense* only discriminated in the blind and elaborate information level. These findings are in agreement with previous studies on wine (Danner et al., 2016) and other food products (Dorado, Chaya, et al., 2016; Ng et al., 2013a; Silva et al., 2017; Spinelli et al., 2014, 2015) showing that commercial products commonly evoke moderately intense positive emotions and less intense negative emotions. However, even though negative emotions are generally perceived less frequently and less intensely compared to positive emotions in the food context (Desmet & Schifferstein, 2008), they can discriminate between samples and deliver important additional information (Bhumiratana, Adhikari, & Chambers, 2014; Danner et al., 2016; He, Boesveldt, de Graaf, & de Wijk, 2016; King, Meiselman, & Carr, 2010, 2013; Ng et al., 2013a; Spinelli et al., 2014, 2015; van Zyl & Meiselman, 2015).

Information level had a significant effect on a multitude of wine-evoked emotions including *adventurous*, *calm*, *contented*, *enthusiastic*, *happy*, *irritated*, *nostalgic*, *optimistic*, *passionate*, *relaxed*, *tense*, *unfulfilled* and *warm-hearted*, whereas more intense positive and less intense negative emotions were evoked during the elaborate information level compared to the blind tasting condition, with the basic sensory description condition ranging between the aforementioned conditions. These results are in agreement with recent studies showing that a wide range of extrinsic product attributes such as packaging/branding (Chaya et al., 2015; Ng et al., 2013b; Schifferstein et al., 2013; Spinelli et al., 2015), health labels (Lagerkvist et al., 2016; Schouteten et al., 2015), or congruent vs incongruent information (Silva et al., 2017) can significantly influence product-evoked emotions. Similar to Spinelli et al. (2015), assimilation of liking towards expectations was associated with an overall improvement of the emotional performance of the product. The improved emotional performance of the wines when consumers are presented more vivid wine descriptions, including quality and favourable winery information, can be useful for the wine and hospitality industries to improve consumer experience of their products.

3.3. Information and wine variety effects on familiarity, willingness to pay and wine quality ratings

Significant main effects of wine variety and information level on familiarity ($F(2, 250) = 32.277$, $p < 0.001$, $F(1.624, 203.051) = 63.128$, $p < 0.001$), willingness to pay for a bottle of wine in a shop ($F(1.743, 217{,}854) = 5.219$, $p = 0.009$, $F(2, 250) = 39.713$, $p < 0.001$) and wine quality ($F(1.843, 230.428) = 6.688$, $p = 0.002$, $F(2, 250) = 41.114$, $p < 0.001$) were found. Investigating the sample effect in more detail (Fig. 5), the results show that the Sauvignon Blanc wine was rated highest in familiarity and the Chardonnay sample lowest with the Riesling ranging between the two. A similar trend was observed for the other two variables, but to a lesser extent. A possible explanation is the very distinct flavour of passionfruit of Sauvignon Blanc (Lund et al., 2009), whereas aged and/or oaked white wines such as the Chardonnay used in this study might be less known by regular wine consumers.

As expected, the familiarity rating increased from blind to informed condition, whereas no significant differences between the basic and elaborate description were observed, irrespective of variety, indicating that the sensory description is most important for familiarity and the additional information in the elaborate condition did not improve familiarity with the wine flavour (Fig. 5). Willingness to pay for a bottle of wine in a shop was substantially increased by providing basic wine descriptions and even further increased by the elaborate information, resulting in an increase in willingness to pay between blind tasting and elaborate condition of 21% for the Sauvignon Blanc, 29% for the Riesling and 37% for the Chardonnay sample (Fig. 5). A similar trend was found for wine quality, where the quality rating was increased by 0.5 points between blind and elaborate information level (Fig. 5). This agrees with previous findings showing that extrinsic characteristics such as branding and country of origin significantly influence price (willing to accept) and quality evaluation of red wine by wine novices and wine experts (D'Alessandro & Pecotich, 2013). Furthermore, these findings have important implications for hospitality and sales personnel in winery and wine retailers, as they clearly show that if consumers are provided with additional wine description information, particularly using emotive language, they might be willing to pay more for wines and also perceive the wines to be of higher quality, and therefore potentially increase purchase and/or repurchase probability.

Significant interactions between sample and information effects were only observed for the familiarity rating ($F(3.554, 44.662) = 3.204$, $p = 0.017$) but not for willingness to pay and wine quality ($p > 0.05$). These interactions are caused by the substantially higher increase in the familiarity rating for the Chardonnay sample between blind tasting and informed condition, compared to the other two samples, reinforcing that consumers might not be very familiar with oak flavours in white wines.

3.4. Influence of hedonic disconfirmation on emotional responses, willingness to pay and wine quality ratings

Results of MANOVA showed that degree of hedonic disconfirmation (as defined as the difference between expected and informed liking) had a significant effect on wine-evoked emotions ($F(114, 4074) = 2.882$, $p < 0.001$). The univariate ANOVA indicated significant effects of hedonic disconfirmation on 18 out of the 19 analysed emotions, with

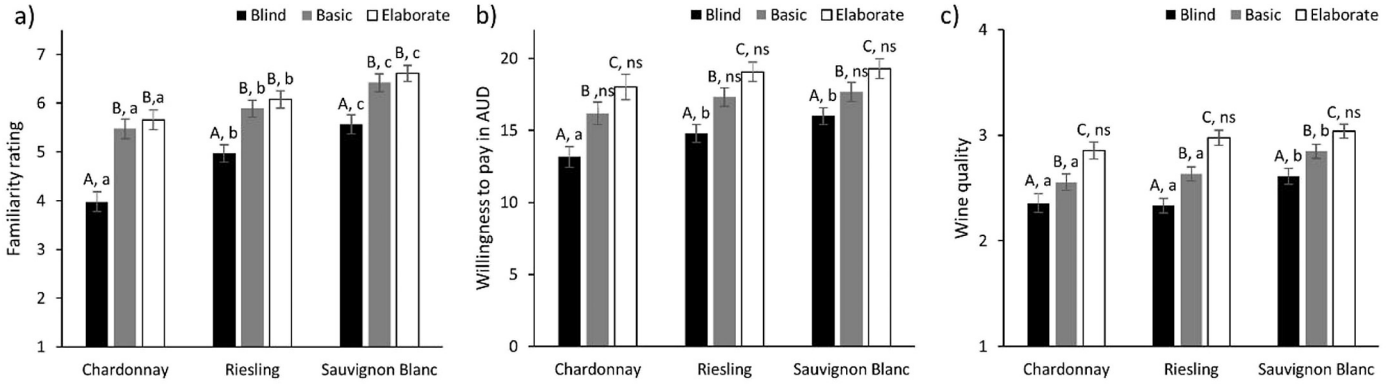

Fig. 5. Effect of information level (blind, basic and elaborate) on a) familiarity, b) willingness to pay for a bottle of wine in a bottle shop in AUD and c) wine quality ratings. Familiarity was rated on a 9-point scale ranging from 1-not familiar to 9-very familiar. Wine quality was rated on a 4-point scale from 1-low quality to 4-high quality. Capital letters indicate significant differences in ratings within one wine variety, lower case letters indicate significant differences in liking ratings across wine variety based on post-hoc comparisons using Fisher's LSD $p < 0.05$. Error bars indicate standard error.

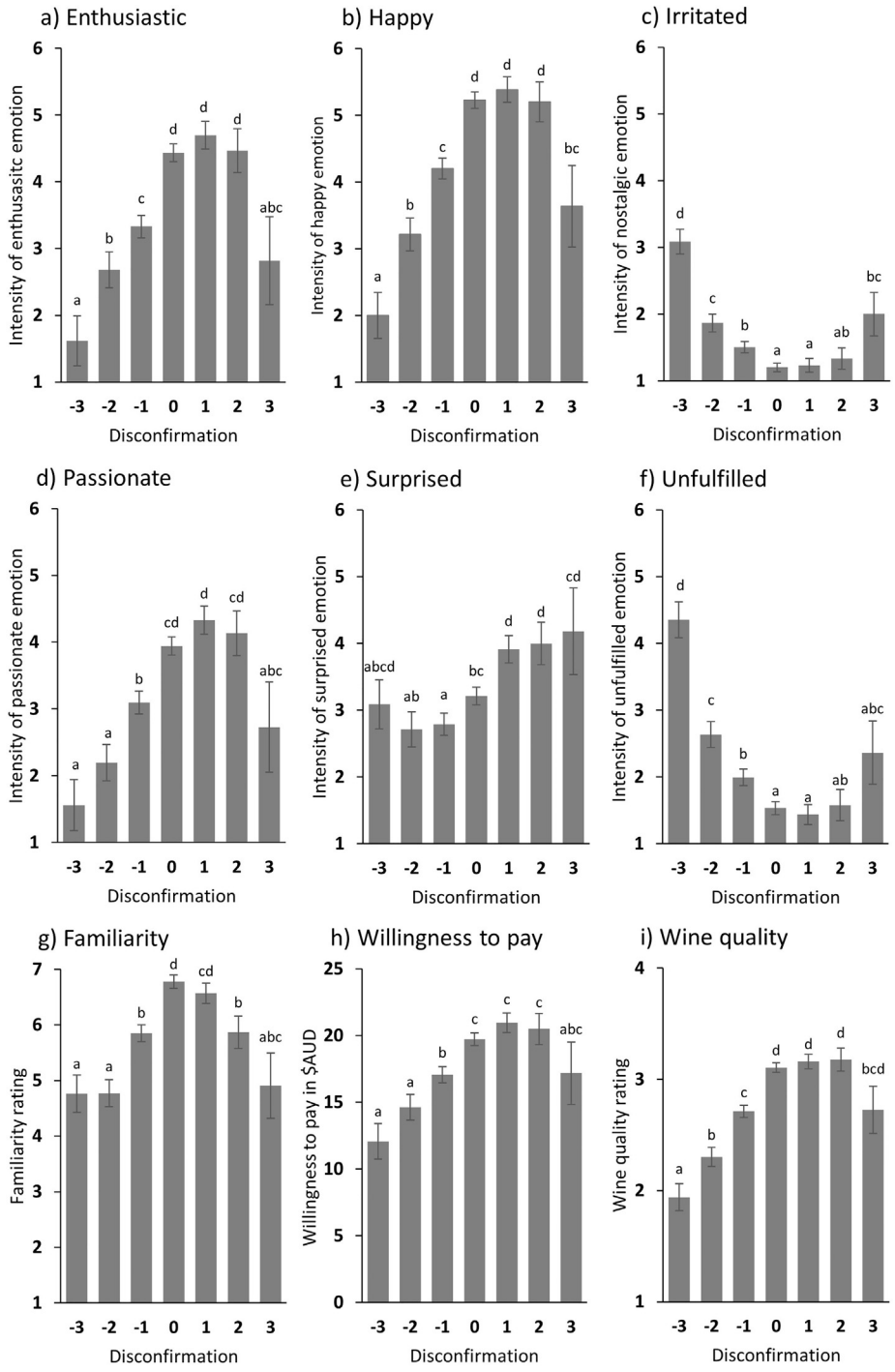

Fig. 6. Influence of disconfirmation (expected liking minus informed liking, measured on a 9-point hedonic scale) on selected wine-evoked emotions; a) enthusiastic, b) happy, c) irritated, d) passionate, e) surprised, f) unfulfilled; and g) familiarity; h) willingness to pay and i) wine quality, pooled for wine variety and information level. Emotion intensities were measured on a 9-point scale ranging from 1 = not at all to 9 = extremely. Willingness to pay for a bottle of wine in a shop was stated in AUD and wine quality was rated on a 4-point scale ranging from 1-low quality to 4-high quality. Lower case letters indicate significant differences between disconfirmation levels within one emotion term based on post-hoc comparisons using Fisher's LSD $p < 0.05$. Error bars indicate standard errors. $n(-3) = 34$, $n(-2) = 66$, $n(-1) = 167$, $n(0) = 264$, $n(1) = 112$, $n(2) = 45$ and $n(3) = 11$.

envious being the only non-significant emotional term. Fig. 6a–f and Supplementary Table A3 show that if the informed liking exceeded the expected liking by 1 point; participants perceived most intense positive emotions of *adventurous*, *calm*, *enthusiastic*, *happy*, *nostalgic*, *relaxed*, *passionate and warm-hearted* which declined when disconfirmation increased or decreased (Supplementary Table A3 summarises means, SE and post-hoc comparison for all 19 emotions, familiarity, willingness to pay and wine quality). The opposite trend was observed for negative emotions such as *irritated* and *unfulfilled* indicating that participants felt the least intense negative emotions when their expectations were met or slightly exceeded, and if expectations were not met participants felt significantly more intense negative emotions. What is interesting is that if expectations were exceeded by 3 points, participants also felt slightly more intense negative emotions. As expected, the results for surprised showed that if expectations were exceeded participants felt more surprised as if the expectations were met. Interestingly, no significant differences were found when expectations were not met, indicating that participants tend to use surprised predominantly in a positive way.

Significant effects of disconfirmation were also observed on familiarity ($F(6, 692) = 15.454$, $p < 0.001$), on willingness to pay for a bottle of wine in the shop ($F(6, 692) = 10.975$, $p < 0.001$) and wine quality rating ($F(6, 692) = 27.803$, $p < 0.001$). Fig. 6g–i clearly shows that if expectations were met or exceeded, participants were willing to pay more for a bottle of wine and also rate the wine quality higher, compared to if expectations were not met. Similar effects were found for familiarity with the wine flavour, as expected familiarity was highest when the expectations were met and decreased with increasing disconfirmation. These results align with the effects of disconfirmation on emotional responses and highlight the importance that information presented together with the wine reflects consumers' perception of the wine.

Literature on investigating how confirmation and disconfirmation of expectations influence food-evoked emotions is still very scarce, and to the best of the authors' knowledge, no studies have been published using wine. Investigating beer and alcohol free beer, Silva et al. (2017) showed that if expected liking is met or exceeded by the actual liking of a product, participants tended to feel more positive and less negative emotions. Similar effects were found by Spinelli et al. (2015) indicating that products achieve the best emotional performance if expectations are met by the actual experience and decrease if they are not met even if expectations were exceeded. The presented study supports the previous findings indicating that emotion measures can deliver important information on how well consumers' expectations are met. However, it also indicates that a more differentiated view is required when expectations are exceeded. Whereas, exceeding expectations by 1 to 2 points on a 9-point hedonic scale resulted in similar or slightly more intense positive emotional responses compared to when expectations were met, a further positive increase in disconfirmation did not result in a further increase of emotional performance, instead participants whose expectations were exceeded by 3 points felt less positive and more negative emotions.

3.5. Limitations

Some limitations of the present study need to be discussed. Presenting the same wine twice in one session (basic and elaborate information level) bears the risk that consumers might recognise the wine which would result in a bias of the results. To overcome this, the samples were presented following a sequential monadic design with a well-defined neutralisation period between the wines. Furthermore, a manipulation check was performed after the second tasting session. During check-out, every participant was asked what they thought about the wines, what wines they liked and what they thought the purpose of the study was. Only 2 participants indicated that some of the wines of the second session tasting were very similar to the first tasting and asked if they tasted the same varieties in the first study. None of the participants mentioned that they tasted the same wines twice during session 2. On the contrary, a majority of participants mentioned that receiving information made the tasting more interesting and easier for them.

At this point it must be noted the number of cases exceeding 2 points of disconfirmation is rather low ($n = 11$) and further studies evoking larger disconfirmations are required to investigate the effect of disconfirmation on product-evoked emotions in more detail.

Although this study found clear evidence that information in the form of wine descriptions can influence consumers' perception of wine, further studies are required to investigate the effect size compared to other external factors such as brand, price and country of origin, and especially how important these extrinsic cues are in real-life consumption and choice situations versus incentivised consumers in central location testing laboratories.

Inherently, the length of the wine descriptions in this study varied between the basic and elaborate versions for each wine. The design of the current study does not allow the seperation between the factors: length of the description and the level of content. One would need to conduct a similar study in which two sets of labels were the same length but differed in content, which in the case of comparing a basic versus elaborate description poses an experimental challenge.

4. Conclusions

This study was the first to explore the effects of wine descriptions (information levels) on consumers' emotions, liking and willingness to pay for Australian white wines. The results showed that presentation of wine descriptions (based solely on objectively defined, sensory information) to consumers when they tasted and evaluated wine, significantly increased their wine liking, willingness to pay for the wine, and elicited more intense positive and less intense negative emotions compared to blind tasting. By adding statements describing the high wine quality and favourable winery and vineyard information together with a more vivid description of the sensory characteristics, the positive responses were improved even more. This highlights not only the importance of well written back-labels and web-site information, but also that information can influence consumers' wine drinking experience and possibly their behaviour. Another interesting finding is that most intense positive and least intense negative emotions were evoked and increased willingness to pay and wine quality perception observed when expectations were met or slightly exceeded by the actual experience, indicating that emotion measures can deliver valuable information of how well consumers' expectations are met. This research highlights that producers may need to take careful consideration of wine description information. One company strategy may be to involve consumers in the process of writing the wine descriptions as part of a wine package optimization.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at http://dx.doi.org/10.1016/j.foodres.2017.05.019.

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